



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/773,343	02/06/2004	Paul R. Sharps	1613370-0046 CON	6467

7590 01/04/2005

Casey Toohey Emcore Corporation
16000 Eubank Boulevard, SE
Albuquerque,, NM 87123

EXAMINER

DIAMOND, ALAN D

ART UNIT	PAPER NUMBER
----------	--------------

1753

DATE MAILED: 01/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/773,343

Applicant(s)

SHARPS ET AL.

Examiner

Alan Diamond

Art Unit

1753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 6/18/04, 8/30/04, and 10/18/04.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 37-111 is/are pending in the application.
- 4a) Of the above claim(s) 74-85 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 37-73 and 86-111 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 October 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Comments

1. The objection to the drawings has been overcome by Applicant's amendment of the specification.
2. The Examiner acknowledges that the continuity data has been amended so as to reflect that Serial No. 09/999,598 has issued as U.S. Patent 6,680,432.
3. The Examiner acknowledges that claim 1 has been canceled.

Specification

4. In the continuity data on page 1 of the specification, the Examiner acknowledges that Serial No. 10/280,593 has been allowed. Applicant should insert the U.S. patent number for said Serial No. 10/280,593 when after the patent issues.
5. The disclosure is objected to because of the following informalities: On page 19, at line 26, a period needs to be inserted after the word "sense". Appropriate correction is required.

Election/Restrictions

6. Newly submitted claims 74-85 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: Claims 37-73 and 86-111 (Group I) are drawn to a (solar cell) semiconductor device classified in 136/255. Claims 74-85 (Group II) are drawn to a method of making an integrated semiconductor structure (solar cell) classified in class 438/74. The inventions are distinct, each from the other because of the following reasons:

Art Unit: 1753

Inventions Group II and Group I are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case, the process as claimed can be used to make other and materially different product, such as one wherein a single junction solar cell rather than a multijunction solar cell is used, or a materially different product such as a thyristor having a bypass diode. Note, for example U.S. Patent 4,083,063 shows a thyristor with an integrally mounted bypass diode.

Please also note that there is burden because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification. There is also burden because these inventions are distinct for the reasons given above and the search required for Group II is not required for Group I.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 74-85 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Suggested Claim Language

7. In claim 93, at line 5, it is suggested that the word "in" be inserted after "region".

Claim Rejections - 35 USC § 112

8. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

9. Claims 88 and 107-111 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

In claim 88, the integrated semiconductor structure wherein the first portion overlies the second portion (as required in parent claim 86), and, at the same time, the first portion and second portion are separated by a trough, is not supported by the specification, as originally filed.

The solar cell semiconductor structure in claim 107 is not supported by the specification, as originally filed. In particular, at lines 5-7, the "second region in which the corresponding sequence of layers above said lower portion forms a bypass diode to protect said cell against reverse biasing at less than breakdown voltage" is not supported by the specification, as originally filed. The Examiner cannot find such a structure in any of the drawings, or in the specification, as originally filed. The same applies to dependent claims 108-111.

10. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Art Unit: 1753

11. Claims 39-43, 51, 52, 54, 56, 65-73, 86, 89, and 93-111 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 39 is indefinite because "the layers" at line 1 lack positive antecedent support in claim 38. The same applies to dependent claims 40-43. It is suggested that said term be changed to "layers" at said line 1.

Claim 39 is indefinite because "the active layers" at line 2 lack positive antecedent support in claim 38. The same applies to dependent claims 40-43. It is suggested that said term be changed to "active layers" at said line 2.

Claim 51 is indefinite because the term "said one cell" bridging lines 1 and 2 lacks positive antecedent support in claim 50. It is suggested that said term be changed to "of the multijunction solar cell".

Claim 52 is indefinite because the term "the semiconductor body" at line 1 lacks positive antecedent support in claim 50. It is suggested that said term be changed to "semiconductor structure".

Claim 54 is indefinite because "the subcells" at line 2 lack positive antecedent support in claims 50 and 53. It is suggested that in parent claim 50, at line 4, the word "cells" be changed to "subcells".

Claim 56 is indefinite because "said first and second subcells" at line 2 lack positive antecedent support in claims 50, 53, and 55. It is further noted that "subcells" at lines 2 and 3 of claim 56 lack positive antecedent support in claim 55. It is suggested that the following changes be made: in parent claim 50, at line 4, the word "cells" be

Art Unit: 1753

changed to "subcells"; and the term "said first and second subcells" at line 2 of claim 56 be changed to "first and second said subcells".

Claim 65 is indefinite because it is not clear which cell is being referred to by the term "said cell" at line 7. Note that claim 65, at line 5, recites "at least one cell" and recites "a multijunction solar cell". The same applies to dependent claims 66-73. It appears that the term "said cell" at line 7 of claim 65 should be changed to "said at least once cell".

Claim 71 is indefinite because claim 69 from which it depends is not drawn to "A solar divide". It is suggested that the term "A solar divide of claim 69" at line 1 of claim 71 be changed to "A device as defined in claim 69".

Claim 72 is indefinite because claim 69 from which it depends is not drawn to "A solar device". It is suggested that the term "A solar device of claim 69" at line 1 of claim 72 be changed to "A device as defined in claim 69".

Claim 86 is indefinite because the term "the base" at line 7 lacks positive antecedent support in claim 86 itself. It is suggested that said term be changed to "a base".

Claim 88 is indefinite because it is not clear how the first portion overlies the second portion (as required in parent claim 86), and, at the same time, the first portion and second portion are separated by a trough.

Claim 89 is indefinite because "said first and second solar cells grown in a first process" at lines 1-2 lack positive antecedent support in claim 86. It is suggested that the word "are" be inserted after "cells" at line 2 of claim 89.

Claim 93 is indefinite because the term "the corresponding sequence of layers" at line 5 lacks positive antecedent support in claim 93 itself. The same applies to dependent claims 94-99. It is suggested that said term be changed to "the sequence of layers corresponding to the sequence of layers forming said cells".

Claim 93 is indefinite because it is not clear which sequence of layers is being referred to by the term "said sequence of layers" at line 7. The same applies to dependent claims 94-99. If the change suggested in the immediately preceding paragraph is made, then it is suggested that the term "said sequence of layers" at line 7 of claim 93 be changed to "the sequence of layers in the first and second regions".

Claim 94 is indefinite because "the lateral conduction layer in the second region" at line 2 lacks positive antecedent support in claim 93. If all of the above suggested changes for claim 94 are made, then this rejection will be overcome.

Claim 100 is indefinite because the term "the corresponding sequence of layers" at lines 5-6 lacks positive antecedent support in claim 100 itself. The same applies to dependent claims 101-106. It is suggested that said term be changed to "the sequence of layers corresponding to the sequence of layers forming said at least one cell".

Claim 100 is indefinite because it is not clear which sequence of layers is being referred to by the term "said sequence of layers" at line 7. The same applies to dependent claims 101-106. If the change suggested in the immediately preceding paragraph is made, then it is suggested that the term "said sequence of layers" at line 7 of claim 100 be changed to "the sequence of layers in the first and second regions".

Claim 107 is indefinite because the term "the lower portion" at line 4 lacks positive antecedent support in claim 107 itself. The same applies to dependent claims 108-111. It is suggested that said term be changed to "a lower portion".

Claim 107 is indefinite because "the corresponding sequence of layers above said lower portion" at lines 5-6 lacks positive antecedent support in claim 107 itself. The same applies to dependent claims 108-111. The Examiner does not have any suggestions as to how to fix this rejection since it is not clear what is intended to be claimed.

Claim Rejections - 35 USC § 102

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

13. Claims 47-49, 90-93, 95-98, 107, and 110 are rejected under 35 U.S.C. 102(e) as being anticipated by Boutros et al, U.S. Patent 6,635,507.

As seen in Figure 8, and with respect to independent claims 47, 90, 93 and 107, Boutros et al teaches a multijunction solar cell comprising a Ge substrate (802); a first region including the N and P GaAs layers (804) which form a first junction of the multijunction solar cell and the N and P GaInP layers (806) which form a second

Art Unit: 1753

junction of the multijunction solar cell, wherein this first region includes the portion of said N and P GaAs layers (804) and the portion of the N and P GaInP layers (806) not directly below, but to the right of the GaAs cap layer. In a second region, the portions of corresponding N and P GaAs layers (804) and N and P GaInP layers (806) directly below the GaAs Cap support the bypass diode (810) to protect the cell against reverse biasing (see also col. 1, lines 16-22; and col. 7, lines 47-65). Said first and second regions in said Figure 8 clearly are laterally spaced apart, as in claims 47 and 90. With respect to claims 97 and 107, when the GaAs p^{++} layer is considered the lateral conduction layer, then the bypass diode above it reads on the instant etch stop layer. Alternatively, with respect to claims 97 and 107 when the GaAs Cap N^{++} layer is considered the lateral conduction layer, then the GaAs p^{++} layer reads on the instant etch stop layer.

With respect to claims 48 and 91, when Boutros et al's sequential deposition steps (col. 8, lines 4-46) are considered a growth step, then the layers of the multijunction solar cell and bypass diode are grow sequentially in the same process step, i.e., the process step is the sequential growth of the layers. After the growth step, there is etching (see col. 8, lines 37-46).

With respect to claim 98, and as clearly seen in said Figure 8, the Ge substrate (802) forms an electrical connection path between the multijunction solar cell and the bypass diode.

Art Unit: 1753

In an alternative with respect to claim 107, the N and P GaAs layers (804) and N and P GaInP layers (806) encompass the instant first region, and the bypass diode (810) encompasses the instant second sequence of layers.

Since Boutros et al teaches the limitations of the instant claims, the reference is deemed to be anticipatory.

14. Claims 37-41, 43, 44, 47, 48, 65, 66, 68, 69, 86, 87, 89-91, 93, 95, 97-99, 107, and 108 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 9-64397, herein referred to as JP '397.

JP '397's solar module in Figure 2 comprises a conductive substrate (203); a multijunction solar cell (201) having first (204A, 205A, 206A) and second (204B, 205B, 206B) subcells formed on a first portion of the substrate; bypass diode (202) formed on a second portion of the substrate (203) having p-type, i-type and n-type layers (205A, 204B, 207D); and metal contact layers (208, 208D) (see also paragraphs 0031 to 0045). As seen in Figure 2, the bypass diode (202) is clearly integral with and laterally spaced apart from both the first and second subcells.

With respect to claim 39, Figure 3 of JP '397 shows another embodiment of the solar module. In this embodiment, the bypass diode (302) is grown over the layers of the subcells. The bypass diode (302) is integral with at least the subcell (304A, 305A, 306A) since said subcell (304A, 305A, 306A) and bypass diode (302) are both integral with the substrate (302) (see Figure 3).

With respect to claims 41 and 43, the contact (108D,208D,308D) is metal (see paragraph 0040), and it is the Examiner's position forms a metal/semiconductor Schottky junction as here claimed.

With respect to claim 44, the substrate can be considered to be lower-most semiconductor layer (204A,304A), which can contain Ge (see paragraph 0037).

With respect to claims 48 and 91, as clearly seen in Figure 2, the sequence of layers of the subcells and the sequence of layers of the bypass diode would clearly be grown in the same process step.

With respect to claims 65, 86, 99, and 108, the metal lead wire (209,309) together with the metal contact (208D,308D) read on the instant metal contact.

With respect to claims 66, 93, 100, and 107, the substrate (303) is also a lateral conduction layer. With respect to claim 95 and in the alternative, the lateral conduction layer can be considered to be semiconductor layer (304A), which is doped either n-type or p-type (see paragraph 0025).

With respect to claim 68 and 97, any of the layers (304A to 307) above the substrate (303), or any of the layers (305A to 307) above layer (304A) reads on the instant stop etch layer.

With respect to claim 89, as clearly seen in Figure 3, the sequence of layers of the subcells and the sequence of layers of the bypass diode would clearly be grown in a different, subsequent process step.

Since JP '397 teaches the limitations of the instant claims, the reference is deemed to be anticipatory.

Art Unit: 1753

15. Claims 47-57, 59, 61, 65-68, 70, and 86-11 are rejected under 35 U.S.C. 102(b) as being anticipated by Ho et al, WO 99/62125. See Figures 12 and 14B, and page 8, lines 16-23, which teach the claimed invention.

Ho et al's multijunction solar cell has a first portion at the left having a first GaAs subcell (1412-1416) and a second GaInP subcell (1422-1426); and a second portion laterally spaced apart from the first portion by a trough and including bypass diode (1410) that is integral with said first subcell (see Figure 18B; and page 8, lines 18-23). The diode (1410) includes a metal/semiconductor contact comprising front metal contact (1440), which, it is the Examiner's position, forms a Schottky junction with the tunnel diode layer N^{++} . The solar cell has a Ge substrate (1402-1404) (see Figure 14B). The combination of Ho et al's metal contact (1436) and front metal contact (1440) reads on the instant metal layer. The tunnel diode layers (1418) and (1420) in both said first and second portions in said Figure 14B read on the instant lateral conduction layer. Since Ho et al teaches the limitations of the instant claims, the reference is deemed to be anticipatory.

Claim Rejections - 35 USC § 103

16. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 1753

17. Claims 47-49, 65, 66, 68, 70, 86, 87, 89-93, 95-99, 107, 108, and 110 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boutros et al, U.S. Patent 6,635,507.

As seen in Figure 8, and with respect to independent claims 47, 65, 86, 90, 93 and 107, Boutros et al teaches a multijunction solar cell comprising a Ge substrate (802); a first region including the N and P GaAs layers (804) which form a first junction of the multijunction solar cell and the N and P GaInP layers (806) which form a second junction of the multijunction solar cell, wherein this first region includes the portion of said N and P GaAs layers (804) and the portion of the N and P GaInP layers (806) not directly below, but to the right of the GaAs cap layer. In a second region, the portions of corresponding N and P GaAs layers (804) and N and P GaInP layers (806) directly below the GaAs Cap support the bypass diode (810) to protect the cell against reverse biasing (see also col. 1, lines 16-22; and col. 7, lines 47-65). Said first and second regions in said Figure 8 clearly are laterally spaced apart, as in claims 47 and 90. With respect to claims 66, 68, 70, 97, 107, when the GaAs p^{++} layer is considered the lateral conduction layer, then the bypass diode above it reads on the instant etch stop layer. Alternatively, with respect to claims 97 and 107 when the GaAs Cap N^{++} layer is considered the lateral conduction layer, then the GaAs p^{++} layer reads on the instant etch stop layer. As seen in Figure 8, there is a connecting electrical contact (816) deposited on a portion of the substrate (802) and over a portion of the bypass diode (i.e., over a portion of the second region). Clearly, this electrical contact is for shorting

Art Unit: 1753

the multijunction solar cell (in both regions) and to electrically connect to said bypass diode in the second region.

With respect to claims 48 and 91, when Boutros et al's sequential deposition steps (col. 8, lines 4-46) are considered a growth step, then the layers of the multijunction solar cell and bypass diode are grown sequentially in the same process step, i.e., the process step is the sequential growth of the layers. After the growth step, there is etching (see col. 8, lines 37-46).

With respect to claim 89, and in an alternative with respect to the immediately preceding paragraph, the first and second solar cells (804,806) can be considered to be grown in a first process, and then the bypass diode (810) can be considered to be grown in a second process after the first process.

With respect to claim 98, and as clearly seen in said Figure 8, the Ge substrate (802) forms an electrical connection path between the multijunction solar cell and the bypass diode.

In an alternative with respect to claim 107, the N and P GaAs layers (804) and N and P GaInP layers (806) encompass the instant first region, and the bypass diode (810) encompasses the instant second sequence of layers.

Boutros et al teaches the limitations of the instant claims other than the difference which is discussed below

With respect to claims 65 and 86 (and their dependent claims), and also with respect to claims 99 and 108, Boutros et al does not specifically teach that said connecting contact (816) can be made from metal (i.e., instant metal layer). However,

Art Unit: 1753

as shown by reference sign (1436) in Figure 14B of Ho et al, it is well-known and conventional in the solar cell art to form connecting solar cell contacts from metal (see also page 8, lines 18-23). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have prepared Boutros et al's connecting contact (816) from metal because it is well-known and conventional in the art to do so, as shown by Ho et al.

Double Patenting

18. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

19. Claims 37-73 and 86-111 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 2-30 of copending Application No. 10/280,593. Although the conflicting claims are not identical, they are not patentably distinct from each other because, although not of the same scope as the instant claims, the claims of said copending application are anticipatory of the instant claims.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

20. Claims 47-59, 61, 65-68, 70, and 90-111 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 48-98 of copending Application No. 10/723,456. Although the conflicting claims are not identical, they are not patentably distinct from each other because although not of the same scope as the instant claims, the claims of said copending application are anticipatory of the instant claims.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

21. Claims 47-59, 61, 65-68, 70, and 90-111 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-35 of U.S. Patent No. 6,680,432. Although the conflicting claims are not identical, they are not patentably distinct from each other because although not of the same scope as the instant claims, the claims of said patent are anticipatory of the instant claims.

Response to Arguments

22. Applicant's arguments filed 08/30/2004 and 10/18/2004 have been fully considered but they are not persuasive.

With respect to claims 37 and 47, Applicant argues that in Figure 1 of JP '397, there is no correspondence of layers between the diode (102) and the solar cell (101). Applicant argues that a similar conclusion can be drawn from Figures 2-9 in JP '397. However, this argument is not deemed to be persuasive because, for example, Figure 2

Art Unit: 1753

of JP '397 is pertinent to instant claims 37 and 47. In particular, the bypass diode (202) in said Figure 2 is integral with the first subcell in said Figure 2 by way of common layer 205A and is integral with the second subcell in said Figure 2 by way of common layer 204B.

With respect to claims 86, 87, 89-91, 93, 95, 97-99, 107, and 108, Applicant argues that these claims recite features, such as a metal layer or lateral conduction layer, that are not taught or rendered unpatentable by JP '397. However, this argument is not deemed to be persuasive because, as noted above, the metal lead wire (209,309) together with the metal contact (208D,308D) read on the instant metal contact. The substrate (303) is a lateral conduction layer. Alternatively, the lateral conduction layer can be considered to be semiconductor layer (304A), which is doped either n-type or p-type.

In the response filed 08/30/2004, Applicant provides arguments that claims 82-86 and 90-93 are method claims. However, this argument is not deemed to be persuasive because said claims 62-86 and 90-93 are not method claims. It should be noted that claims 74-85 are the method claim, and said claims 74-85 have been withdrawn from consideration.

Conclusion

23. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 6,452,086, US 6,476,313, US 6,690,041, and US 2004/0149331 are hereby made of record.

Art Unit: 1753

24. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

25. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alan Diamond whose telephone number is 571-272-1338. The examiner can normally be reached on Monday through Friday, 5:30 a.m. to 2:00 p.m. ET.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

Art Unit: 1753

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Alan Diamond
Primary Examiner
Art Unit 1753

Alan Diamond
December 30, 2004

A handwritten signature in black ink, appearing to read 'Alan Diamond', with a stylized, cursive script.